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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/762,919

01/22/2004

Keith Crawford

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7590
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05/29/2008

EXAMINER

CHORBAJI, MONZER R

ART UNIT

PAPER NUMBER

1797

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/762,919	Applicant(s) CRAWFORD ET AL.	
	Examiner MONZER R. CHORBAJI	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This final action is in response to the amendment received on 2/13/08

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433).

Yoshiharu discloses a particulate neutralization system (drawing 1:1, 2 and paragraph 0027, lines 1-3) that includes an ultraviolet tube (paragraph 0030, lines 1-2); and a light panel (drawing 1:1, 2) including a frame (the housing mentioned in paragraph 0007) and a porous mat (paragraph 0021, lines 3-8) attached to the frame, the light panel bisecting the air stream (paragraph 0001 where a filter must be in a perpendicular position with respect to the directional flow of the contaminated air), the porous mat composed of a plurality of end emitting optical fibers (drawing 2:4 and paragraph 0016, lines 5-6 where the light guide section transfers light applied at one of its ends from a UV source through its inner walls toward the other end where the reflected light is emitted) disposed within the frame, a first end of each of the end emitting optical fiber disposed within the frame and towards the lamp (paragraph 0025, lines 4-5), a second end of each the end emitting optical fiber disposed within the porous mat (drawing 3b:3, 4 where the optical waveguide fibers are placed within the porous mat and paragraph 0039, line 3) so as to communicate a plurality of ultraviolet beams to form a field through which the air stream passes. In addition, Yoshiharu further teaches that the filter has a housing (paragraph 0007, lines 6-7) and is used in devices as an air cleaner (paragraph 0001). Yoshiharu fails to teach placing the end emitting optical fibers in the porous mat in a random and non-parallel arrangement so

that the second end of each emitting optical fiber terminates within the porous mat so as to communicate a plurality of UV beams within the porous mat.

Tribelski disinfects air by having optical fibers integrated into filter elements where the optical fibers are arranged into the fiber material in a random and non-parallel arrangement (col.25, lines 56-67, col.26, lines 1-10, and figure 4:40, 42-43, 46-47, and 55-56) in order to obtain the benefit of filtering out particulate material above a predetermined size (col.23, lines 47-51). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the light panel in Yoshiharu with random arrangement of optical fibers within a filter in order to obtain the benefit of filtering out particulate material above a predetermined size as explained by Tribelski (col.23, lines 47-51).

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433) and Glazman (U.S.P.N. 5,635,133).

Yoshiharu discloses a particulate neutralization system (drawing 1:1, 2 and paragraph 0027, lines 1-3) that includes an ultraviolet tube (paragraph 0030, lines 1-2); and a light panel (drawing 1:1, 2) including a frame (the housing mentioned in paragraph 0007) and a porous mat (paragraph 0021, lines 3-8) attached to the frame, the light panel bisecting the air stream (paragraph 0001 where a filter must be in a perpendicular position with respect to the directional flow of the contaminated air), the porous mat composed of a plurality of end emitting optical fibers (drawing 2:4 and paragraph 0016, lines 5-6 where the light guide section transfers light applied at one of

its ends through its inner walls toward the other end where the reflected light is emitted) , a first end of each of the end emitting optical fiber disposed towards the lamp (paragraph 0025, lines 4-5), a second end of each the end emitting optical fiber disposed within the porous mat (drawing 3b:3, 4 where the optical waveguide fibers are placed within the porous mat and paragraph 0039, line 3) so as to communicate a plurality of ultraviolet beams to form a field through which the air stream passes. Yoshiharu further teaches that the filter has a housing (paragraph 0007, lines 6-7) and is used in devices as an air cleaner (paragraph 0001) where one of ordinary skill in the art would recognize that the filter is slidably disposed in the device through an opening in a position perpendicular to the flow of the contaminated air stream. Yoshiharu fails to teach placing the end emitting optical fibers in the porous mat in a random and non-parallel arrangement so that the second end of each emitting optical fiber terminates within the porous mat so as to communicate a plurality of UV beams within the porous mat and placing the filter in a duct of an air treatment system having the following: a duct having an exterior surface with a first opening and a second opening and an interior volume through which an air stream is directed; a lamp at least one ultraviolet tube therein, the lamp is fixed to the exterior surface over the first opening; an optically transmissible element secured to the duct between the lamp and the interior volume so as to prevent the air stream from contacting the ultraviolet tube.

Tribelski disinfects air by having optical fibers integrated into filter elements where the optical fibers are arranged into the fiber material in a random and non-parallel arrangement (col.25, lines 56-67, col.26, lines 1-10, and figure 4:40, 42-43, 46-47, and

55-56) in order to obtain the benefit of filtering out particulate material above a predetermined size (col.23, lines 47-51). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the light panel in Yoshiharu with random arrangement of optical fibers within a filter in order to obtain the benefit of filtering out particulate material above a predetermined size as explained by Tribelski (col.23, lines 47-51).

Tribelski fails to teach placing the filter in a duct having a UV lamp fixed to the duct exterior surface and the use of an optically transmissible element. Glazman discloses a particulate neutralization system (figure 4:10) that includes the following: placing the filter (figure 4:25) in a duct of an air treatment system where the filter is removably secured to the duct (filter 25 in figure 4 is insertable between flanges 24 in the air duct system) and bisecting the air stream (figure 4:12 and 25); a duct (figure 4:22) having an exterior surface (the unlabeled exterior surface of flange 26 in figure 4) with a first opening (unlabeled end of duct 22 that is connected to radiative chamber 28 in figure 4 through flange 26) and a second opening (the unlabeled space with filter 25 is slidable between flanges 24 in figure 4) and an interior volume through which an air stream is directed (figure 4:11); a lamp (figure 4:28) that includes at least one ultraviolet tube therein (figure 4:31) so that microorganisms suspended in the fluid absorb the substantially parallel arrays of beams are killed prior to passing the end of the straight prime duct 22 (col.8, lines 20-22), the lamp (figure 4:28) is fixed to the exterior surface (unlabeled exterior surface of flange 26 in figure 4) over the first opening (unlabeled end of duct 22 that is connected to radiative chamber 28 in figure 4 through flange 26); an

optically transmissible element (figure 4:43) secured to the duct between the lamp and the interior volume (figure 4:11) in order to separate the fluid medium from the parabolic reflectors, lamp envelopes and electrical connectors located in the radiative chamber (col.7, lines 45-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski with the particulate neutralization system so that microorganisms suspended in the fluid absorb the substantially parallel arrays of beams are killed prior to passing the end of the straight prime duct 22 as explained by Glazman (col.8, lines 20-22).

6. Claims 2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433) and Glazman (U.S.P.N. 5,635,133) as applied to claim 1 and further in view of Horton, III (U.S.P.N. 6,730,265 B2).

Regarding claim 2, Yoshiharu, Tribelski, and Glazman are silent with respect that the optically transmissible element is a lens. Horton disinfects air with UV light system (figure 1:10) and teaches that an optical component (such as lenses as mentioned in col.5, lines 45-47) is positioned between the UV light source (figure 1:15) and the UV light source system (figure 1:14) output point (figure 1:16) in order to maximize the intensity, focus, and control of the UV light rays at the output for any given UV light source or lamp (col.5, lines 42-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman with the lens in order to maximize the intensity, focus, and

control of the UV light rays at the output for any given UV light source or lamp as described by Horton (col.5, lines 42-45).

Regarding claims 5-6, Yoshiharu, Tribelski, and Glazman are silent with respect that the first and the second ends of the emitting optical fibers have lenses. Horton disinfects air with UV light system (figure 1:10) and places optical components (figure 1:16, 22, and 32) on both ends of the UV transmission line (figure 1:18) where the optical components are lenses (such as lenses as mentioned in col.5, lines 45-47) in order to provide additional focus and/or control of the UV light for the disinfection of the gas stream (col.5, lines 1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman with the lenses in order to provide additional focus and/or control of the UV light for the disinfection of the gas stream as described by Horton (col.5, lines 1-4).

7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433) and Glazman (U.S.P.N. 5,635,133) as applied to claim 1 and further in view of Deibert (U.S.P.N. 6,063,170).

Regarding claims 3-4, Yoshiharu, Tribelski, and Glazman are silent with respect to placing a pre-filter upstream from the light panel and also to placing a post-filter downstream from the light panel. Deibert provides an air filtration system (figure 1:10) having a pre-filter (figure 1:30) upstream from the UV lamps (figure 1:15) panel in order to effectively remove large micron diameter particles (col.2, lines 40-42) and a post-filter

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(figure 1:28) downstream from the UV lamps (figure 1:15) panel in order to effectively remove odors and particles left in the air flow (col.1, lines 41-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman with the pre and post-filters in order to effectively remove large micron diameter particles and to further remove odors and particles left in the air flow as described by Deibert (col.2, lines 40-42 and col.1, lines 41-42).

8. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433) and Glazman (U.S.P.N. 5,635,133) and further in view of Balkany (U.S.P.N. 5,752,878).

Regarding claim 7,

Yoshiharu in view of Tribelski and Glazman fails to teach providing more than one UV radiative chamber (more than one lamp where each lamp has its own optically transmissible element secured to the duct) that are fixed to the exterior surface of the duct. Balkany treats air within an air conditioning or heating system (col.2, lines 35-37) where multiple UV sources are positioned one after the other in the air handling system (col.1, lines 59-62), because positioning several UV light sources one after the other, the individual sources can be of lower power, which reduces the price of the plant (col.1, lines 61-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman with multiple UV sources, because positioning several UV light sources one after the other,

the individual source can be of lower power, which reduces the price of the plant as explained by Balkany (col.1, lines 61-63).

Regarding claim 13,

Yoshiharu in view of Tribelski and Glazman fails to teach providing more than one UV radiative chamber (more than one lamp where each lamp has its own optically transmissible element secured to the duct) that are fixed to the exterior surface of the duct and also does not specifically teach providing more than one light panel. Balkany treats air within an air conditioning or heating system (col.2, lines 35-37) where multiple UV sources are positioned one after the other in the air handling system (col.1, lines 59-62), because providing a plurality of disinfecting stations arranged at a distance from each other, it becomes possible to keep a large part of the air ducts germ free while keeping the individual disinfecting stations small and simple (col.1, lines 49-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman with multiple disinfecting stations, because providing a plurality of disinfecting stations arranged at a distance from each other, it becomes possible to keep a large part of the air ducts germ free while keeping the individual disinfecting stations small and simple (col.1, lines 49-52).

9. Claims 8, 11-12, 14 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433), Glazman (U.S.P.N. 5,635,133), Balkany (U.S.P.N. 5,752,878) as applied to claims 7, 13 and further in view of Horton, III (U.S.P.N. 6,730,265 B2).

Regarding claims 8 and 14, Yoshiharu, Tribelski, Glazman, and Balkany are silent with respect that the optically transmissible element is a lens. Horton disinfects air with UV light system (figure 1:10) and teaches that an optical component (such as lenses as mentioned in col.5, lines 45-47) is positioned between the UV light source (figure 1:15) and the UV light source system (figure 1:14) output point (figure 1:16) in order to maximize the intensity, focus, and control of the UV light rays at the output for any given UV light source or lamp (col.5, lines 42-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman/Balkany with the lens in order to maximize the intensity, focus, and control of the UV light rays at the output for any given UV light source or lamp as described by Horton (col.5, lines 42-45).

Regarding claims 11-12 and 18-19, Yoshiharu, Tribelski, Glazman, and Balkany are silent with respect that the first and the second ends of the emitting optical fibers have lenses. Horton disinfects air with UV light system (figure 1:10) and places optical components (figure 1:16, 22, and 32) on both ends of the UV transmission line (figure 1:18) where the optical components are lenses (such as lenses as mentioned in col.5, lines 45-47) in order to provide additional focus and/or control of the UV light for the disinfection of the gas stream (col.5, lines 1-4). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman/Balkany with the lenses in order to provide additional focus and/or control of the UV light for the disinfection of the gas stream as described by Horton (col.5, lines 1-4).

10. Claims 9-10 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433), Glazman (U.S.P.N. 5,635,133), Balkany (U.S.P.N. 5,752,878) as applied to claims 7, 13 and further in view of Deibert (U.S.P.N. 6,063,170).

Regarding claims 9-10 and 15-16, Yoshiharu, Tribelski, Glazman, and Balkany are silent with respect to placing a pre-filter upstream from the light panel and also to placing a post-filter downstream from the light panel. Deibert provides an air filtration system (figure 1:10) having a pre-filter (figure 1:30) upstream from the UV lamps (figure 1:15) panel in order to effectively remove large micron diameter particles (col.2, lines 40-42) and a post-filter (figure 1:28) downstream from the UV lamps (figure 1:15) panel in order to effectively remove odors and particles left in the air flow (col.1, lines 41-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman/Balkany with the pre and post-filters in order to effectively remove large micron diameter particles and to further remove odors and particles left in the air flow as described by Deibert (col.2, lines 40-42 and col.1, lines 41-42).

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu (JP 11290695 A- machine translation) in view of Tribelski (U.S.P.N. 6,468,433), Glazman (U.S.P.N. 5,635,133), Balkany (U.S.P.N. 5,752,878) as applied to claim 13 and further in view of Saitou et al (US 2003/0113246 A1).

Yoshiharu, Tribelski, Glazman, and Balkany are silent with respect to placing an intermediate-filter disposed between the two UV light panels. Saitou discloses an air

deodorization apparatus (figure 2:1) where an intermediate filter (figure 2:9) is disposed between two UV light panels (figure 2:8 and 10) in order to deodorize air contaminated with sulfur containing compounds with high efficiency (paragraph 0013, lines 10-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified system in Yoshiharu/Tribelski/Glazman/Balkany with alternating filters and UV lamps in order to deodorize air contaminated with sulfur containing compounds with high efficiency as explained by Saitou (paragraph 0013, lines 10-15).

Response to Arguments

12. Applicant's arguments filed on 02/13/2008 have been fully considered but they are not persuasive.

The amendment to the specification submitted on 02/13/2008 has been accepted.

On pages 10-12 of the Remarks section, Applicant arguments are directed to the newly added limitation, which is placing the end emitting optical fibers in the porous mat in a random and non-parallel arrangement so that the second end of each emitting optical fiber terminates within the porous mat so as to communicate a plurality of UV beams within the porous mat. This limitation has been addressed in Tribelski under the new grounds of rejections as shown above.

On pages 12-13 of the Remarks section, Applicant argues that that optical component 32 in Horton is a device separate from the UV transmission line 18, whereas the lens structure in the present is an integral part of the optical fiber.

Instant claims 5-6, 11-12, and 18-19 do not require that the optical component be an integral part of the optical fiber. Even so, Horton's optical component 32 is considered an integral part of UV transmission line 18 and portal 22.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

14. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R. CHORBAJI whose telephone number is (571)272-1271. The examiner can normally be reached on M-F 9:00-5:30.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jill Warden/

Supervisory Patent Examiner, Art Unit 1797

/M. R. C./

